

This advertisement is intended to attract the attention of every intelligent

Clothing Merchant

In the United States and is appearing today in the 45 principal cities from Maine to California. Its direct purpose is to announce the opening of the

FALL LINE OF SOCIETY BRAND CLOTHES

Ready-made clothes for young men and men who stay young. May be seen either at the main salesrooms in Chicago, 317 Franklin Street, or through our traveling men in their respective territories.

Society Brand Clothes rank today as the best known, the best tailored and the most fashionable line of young men's clothes. Our immense advertising campaign planned for this coming fall will bring forth thousands of additional calls from the public, and every up-to-date merchant should be prepared to meet the demand.

WRITE OR WIRE FOR APPOINTMENTS

ALFRED DECKER & COHN

317 Franklin St., Chicago

Chicago, April 17, 1909

Nitrogen-Gathering Bacteria: Their Share in Farm Fertility

By
Dr. HOWARDS REED,
of the Virginia Polytechnic
Institute.

The history of civilization has largely been a record of man's ability to subjugate the world. His first authority was probably exercised over inanimate objects like stones and logs, which he learned to pile up or his shelter and protection against the elements. Subsequently other objects of wood and stone were obtained and fashioned into the weapons of war and of the chase. From early time mankind has also been engaged in an attempt to harness the animate forms of nature to his advantage. At the early dawn of civilization we find cer-

tain animals in the service of mankind, such as the horse and the dog. At a later period we find mankind owning and raising herds of meat cattle. This industry was largely the outcome of his success in subjugating the horse and the dog, by whose aid he was enabled to herd the cattle and reclaim stray animals. It was much later before man appears to have learned to cultivate, in a systematic way, food-giving vegetables, and right down to our present time the addition of new plants or animals to man's domain has claimed some of the most strenuous endeavors of our investigators.

Impure Blood Thoroughly Cleansed

Relieved of All Impurities Through
the Use of Stuart's Calcium
Wafers.

The blood is a thick, opaque fluid of a rich, red hue in the arteries and a purplish blue in the veins. It derives its color from numerous small bodies floating in it which are called red corpuscles. If the blood be examined under a microscope the red corpuscles will appear as thin, circular disks, floating in a transparent, nearly colorless fluid.

These red corpuscles number 5,000,000 to the cubic centimeter; but it often happens that they become very diminished in number, a condition known as anemia or leukoemia. There are also other circular bodies in the blood known as white corpuscles, which are much less numerous than the red.

The red corpuscles are the stimulating and animating elements of the blood. They absorb oxygen in their passage through the lungs, and convey it to the tissues of the body, where, combining with food elements absorbed from the stomach, it evolves animal heat.

Whenever the kidneys fail to properly filter the blood of its impurities, or whenever constipation occurs, the impure foreign matter collects in the blood-current, is carried to all parts of the system in the circulation, and is usually deposited in the form of pimples and other eruptions upon the skin.

Most of these eruptions appear upon the face, for the reason that the skin there is thinner than anywhere else. Many people commit the error of trying to cure the pimples or eruptions by the application of salves and ointments, which is a great mistake, as the cause of the trouble is deeper seated, and the skin disease is simply the outward manifestation of the impure condition of the blood within.

Calcium Sulphide is the greatest blood purifier in existence. Instead of driving the blood impurities out through the pores, it sends them out through the proper channels—the kidneys and intestines.

STUART'S CALCIUM WAFERS contain calcium sulphide, combined with other powerful alteratives or purifiers, which act rapidly and powerfully upon the morbid products of the blood, expelling them completely, preventing their return, and incidentally removing pimples, boils, blackheads, carbuncles, tetter, ringworm, scurvy and all other skin blemishes.

Call on your pharmacist and secure a package of this wonderful blood-cleansing remedy, price 50 cents. Also write us for trial package free. Address: H. A. Stuart, Co., 173 Stuart Building, Marshall, Michigan.

tain animals in the service of mankind, such as the horse and the dog. At a later period we find mankind owning and raising herds of meat cattle. This industry was largely the outcome of his success in subjugating the horse and the dog, by whose aid he was enabled to herd the cattle and reclaim stray animals. It was much later before man appears to have learned to cultivate, in a systematic way, food-giving vegetables, and right down to our present time the addition of new plants or animals to man's domain has claimed some of the most strenuous endeavors of our investigators.

It is strictly in line with this subjugative side of man's activity to press into service the lower forms of life, such as are popularly known as microbes, yeasts and fungi. In the short space of twenty-five years our knowledge of these organisms has increased almost as rapidly as it was formerly lacking. It must not be imagined that because these creatures are small their powers for good or evil are any less than those of the larger creatures. On the contrary, many of them are closer to us in well-being than any of the larger creatures can possibly be, which man has subjugated, when we realize that myriads of these organisms live within our bodies, others exist in the food that we take in, while countless numbers inhabit the atmosphere in which we live. The study of these vastly important organisms, like the study of man himself, is one of the last things to which science has turned its investigations.

Spinning Gold From Straw. The miller's unfortunate daughter in the old fairy tale was allotted the task of spinning straw into gold, and we are told that the preposterous task was finally accomplished by the intervention of a supernatural being, who had the ability to set all things right. In these days we have learned that the myriads of bacteria in the soil are able to accomplish results which seem almost as preposterous as that of the miller's daughter. To obtain fertility from the atmosphere is one of the fairy tales of science which has recently been shown to occur. For a long time it has been known that the atmosphere contains a vast store of nitrogen in the gaseous form, and it has been the ambition of scientific men to utilize this nitrogen in adding fertility to soil.

When the rock-layers disintegrate to form soil they ordinarily produce a soil which contains all of the ordinary elements required for plant food except compounds of nitrogen, for of this latter class of bodies the rocks contain none. Yet, when productive soils are analyzed, for example, the so-called virgin soils, they are found to contain large quantities of nitrogenous material, as much as 5,000 to 10,000 pounds per acre, to a depth of one foot. How has this been accomplished in stating the fact that all of this nitrogen has been derived in some way from the large store of gaseous nitrogen in the air?

Possibility of a Nitrogen famine. As the question was studied further the constant losses of soil nitrogen—Losses of Nitrogenous Compounds. As they became more skilled in analytical methods, the chemists could not remain blind to the fact, which, indeed, all farmers know from ex-

perience, that there is a constant drain upon the store of nitrogen compounds in the soil. Considerable amounts are removed by growing plants; another part leaches away into the rivers and ultimately finds its way into the ocean; again, the decomposition of animal transforms some of the nitrogen into gaseous forms which escape to the air. Here, then, comes the puzzling problem. How does this rock powder become the receptacle of enormous amounts of nitrogenous compounds, and by what means does Nature replace the losses of nitrogen seemed to be alarming, because of the large amounts which are constantly lost through various activities of man himself. The sewerage from large cities, which is commonly discharged into rivers, contains large amounts of valuable nitrogen, which are carried into the ocean and lost for agricultural purposes. The burning of wood and coal liberates quantities of nitrogen in the gaseous form, which are added to the large reservoir already present in the atmosphere. The use of nitrogenous compounds in the manufacture of explosives is another serious drain upon the world's supply. It has been repeatedly pointed out that the destruction of nitrates in warfare is hardly less calamitous to a country than any of the other evils which follow in the train of warfare. It is no exaggeration to say that the firing of a large gun on a modern battleship

REDUCTIONS

EFFECTIVE APRIL 1st

Pennsylvania Anthracite—per ton	\$6.50
Virginia Anthracite, per ton	\$6.00
Splint Lump, per ton	\$4.50
Sawed Pine, per half cord	\$2.75

We guarantee everything that we sell.

CITY COAL CO.

Lombardy and Broad.
Twenty-ninth and Dock Streets.

destroys more potential fertility than the raising of hundreds of bushels of wheat. Several years ago Sir William Crookes delivered a public address which prophesied dire calamities when the world's supply of nitrogen should be exhausted. He showed by apparently reliable data that the question of life on the earth was, in reality, a question of the amount of combined nitrogen, and that when this supply was exhausted, life would be impossible. Those who read at were agitated by such dire prophecies overlooked the fact that plant and animal life had existed on the earth before any of the natural deposits of nitrates had been formed and that most of the organized life had existed at remote distances from such supplies; consequently, if the earth's nitrogen were a constantly decreasing quantity, life should have been extinct centuries ago. The majority of scientists, instead of being pessimistic, have turned themselves to the more commendable occupation of attempting to learn how nitrates are formed in nature, and whether we can artificially increase their formation in cultivated soils.

The former idea that plants could absorb their nitrogen directly from the atmospheric ocean was soon given up, and it was shown that nitrogen must be combined with other elements to form either ammonia or nitrates before it is available to plants for food.

Different chemists have tried to answer the question by pointing out that small amounts of combined nitrogen, that is, nitrogen compounds, exist in the air in the form of ammonia or of nitric acid. The ammonia arises from decaying organic matter, and the nitric acid is formed by electric discharges, mainly in the course of thunder storms. These theories were, however, discarded when it was shown that the utmost work which could be accomplished by rain and snow in bringing these nitrogen compounds into the soil could not add more than three or four pounds of nitrogen to an acre in the course of a year. Since many times this amount of nitrogen is lost through the processes already mentioned, these theories were obviously inadequate. Not until the rise of modern bacteriology was anything like a promise of solving the question to be perceived. In 1877 proof was afforded that nitrification is a bacterial process and does not take place in soils which are exempt from bacteria.

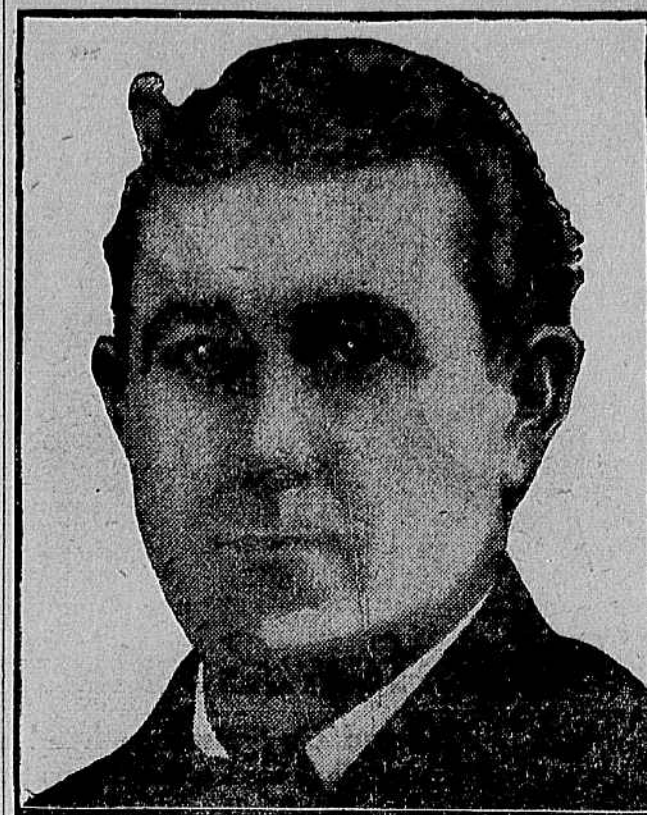
The Agency of Bacteria. In the years that have intervened since the first conclusive experiments upon this subject the scientists have given up many new facts and valuable ideas concerning the increase in soil nitrogen through the agency of bacteria. It is true that much yet remains to be learned, but we are now certain that we are on the proper course, and more and more we will bring to light the truth in due course of time. To many ears this alleged discovery was fully as preposterous as the old idea of spinning straw into gold, but modern work has brought about the realization of a process which is more valuable to mankind than the work of old Rumpelstiltskin in the fairy tale. The bacteria which are responsible for this process take the atmospheric nitrogen and combine it with oxygen through various stages until it comes into a condition where it can be utilized by growing crops.

Another interesting fact is that this process appears to go on most abundantly in soil where there is the greatest need for nitrogenous material. In soil that already contains appreciable amounts of nitrogenous material, the bacteria become lazy and cease to lay hold upon the atmospheric nitrogen, but in nitrogen-poor soils they are compelled to make use of atmospheric nitrogen in lieu of that which might be obtained from the soil or a rich field.

As an instance of the amount of nitrogen which these bacteria are able to accumulate, a single example may be cited. A field belonging to the Agricultural Experiment Station, in England, was abandoned for twenty-two years, producing nothing but wild vegetation during that time. At the end of the twenty-two years it was found that the soil was richer in nitrogen by an amount equal to 152 pounds of nitrate of soda per acre, in addition to the large amounts which had been consumed by the wild vegetation during the time of the experiment. Thus it was learned that the supply of combined nitrogen to the plant world is maintained through the activities of bacteria. The bacteria which accomplish this result differ from all other classes of bacteria, in that they accomplish an addition of nitrogen compounds to the resources of the plant and animal world, and are known as nitrogen-fixing or nitrogen-gathering bacteria. The nitrogen-fixing bacteria may be divided broadly into two classes: those which work alone and those which form partnerships with other plants. The latter also grow in bare soil, but only accomplish a pronounced power of gathering atmospheric nitrogen after they have invaded the roots of certain leguminous plants, and have attained a certain development there.

Legumes and Nitrogen-Gathering Bacteria. It need hardly be said that leguminous crops like clover have always shown manifest aptitude to enrich the soil where they have been grown. The fact has been commented upon by such ancient writers as Pliny and Varro and many others of subsequent times. Opinions differed, however, as to the reason for the soil-enriching qualities of crops like clover. As time went on, different students came to more or less universal agreement that the beneficial effects of leguminous crops were in some way related to the formation of small swellings or nodules upon the roots. The exact nature of these nodules was for many years a subject of speculation. Finally, in 1886, at a meeting of scientists in Berlin the problem was solved. Dr. (Fritz) of Germany presented proof that the soil-enriching power of legumes was due to the fact that there was associated with them a countless number of nitrogen-fixing bacteria, and that the nodules on their roots were caused by these bacteria. In fact, these nodules were the lodging places of the bacteria. He showed that when clover or cowpeas were planted in a not soil where the bacteria had been killed by previously baking it, no nodules were formed. When, however, a pinch of soil from a nodular-forming field was added, bacteria were thereby introduced, and root nodules presently appeared. Since that time scientists have been endeavoring to carry the torch of knowledge into this particular subject of inquiry. The bacteria have been cultivated and studied in laboratories, sorted out and made the recipients of long and well-nigh unpronounceable names; have been introduced into fields of almost all cultivated lands, and their effect upon the various legumes carefully studied. Out of the abundance of results and pseudo-results which have been obtained a few statements may be made with confidence and without error. We have learned with certainty that the bacteria are more or less restricted to certain legumes. For example, the organism that lives in partnership with peas will not be found with corn, and the organism which lives with clover will not grow with alfalfa or soy beans. We have also learned that soil which lacks these organisms may be quickly and densely populated with them by introducing a proper inoculating material. This inoculating material may be a few cultures from a scientist's laboratory or a few loads of manure from a neighbor's field, who has nodules have been produced in abundance upon the roots of a leguminous

Nervous and Generally Run Down



MR. A. A. GRAHAM.

Mr. A. A. Graham, of 181 N. Elizabeth Street, Chicago, Ill., is so pleased with the results derived from taking Duffy's Pure Malt Whiskey, when nervous and run down, he wishes to tell the public, so that men and women who need a good tonic stimulant may know what the world's best tonic and nerve builder has done for him.

Mr. Graham writes: "I have just finished using four bottles of Duffy's Pure Malt Whiskey for a generally run down and nervous condition, and I am so gratified at the results that I feel in duty bound to send you a few words of praise of it. I can truthfully say that it worked wonders with me, and I will cheerfully recommend it to any one, young or old, who is suffering as I had suffered before using your tonic stimulant. Hope this statement will be the means of helping some unfortunate sufferer."

Leading doctors agree that Duffy's Pure Malt Whiskey has no equal as a destroyer of poisonous germs in the body. It is indorsed by clergymen of every faith, nurses and doctors of all schools, as a positive cure for dyspepsia, indigestion, nervous prostration, all diseases of the throat and lungs, every form of stomach trouble, malaria, chills, fever and all run down, weakened, diseased conditions of the body, brain and muscle. It is a heart tonic, blood purifier and promoter of health and long life.

Every testimonial is guaranteed genuine and is published in good faith and with full consent.

Duffy's Pure Malt Whiskey

If you wish to keep young, strong and vigorous and have on your cheeks the glow of perfect health, take Duffy's Pure Malt Whiskey regularly, according to directions. It tones and strengthens the heart action and purifies the entire system. It is recognized as a family medicine everywhere.

CAUTION.—When you ask your druggist, grocer or dealer for Duffy's Pure Malt Whiskey, be sure you get the genuine. It's the only absolutely pure medicinal malt whiskey, and is sold in sealed bottles only; never in bulk. Price \$1.00. Look for the trade-mark, the "Old Chemist," on the label, and make sure the seal over the cork is unbroken. Write Consulting Physician, Duffy Malt Whiskey Co., Rochester, N. Y., for free illustrated medical booklet and free advice.

crop. The best method of inoculation is yet to be discovered, for there are objections to all the methods now in use. A third conclusion which may be drawn from the multitude of experiments is that most of the cultivated soils of the Eastern United States are quite well supplied with all the bacteria necessary for the leguminous crops, with the possible exception of alfalfa and soy beans. The concern of the farmer, therefore, is more in the line of providing suitable conditions for the development and work of these bacteria than in introducing them into his soil. These bacteria will not work in heavy, undrained soils nor in soils altogether lacking in humus, although a small amount seems to suffice for a beginning.

Therefore the most profitable procedure for the farmer, according to our present state of information, is to give the bacteria the square deal. This can be done by frequent plowing,

draining wet soil, adding lime to correct sourness, rotating crops and including as many legumes as possible, and, wherever necessary, using the proper inoculating material. In commencing the culture of alfalfa or soy beans inoculating material should always be used, since the crops are not natives of this region and the soils do not naturally contain their appropriate bacteria.

Invitations Issued. [Special to The Times-Dispatch.] LYNCHBURG, VA., April 17.—Mr. and Mrs. W. H. Anderson have issued invitations to the marriage of their daughter, Mary, to Lloyd C. Myers, which is to take place April 28 at their home, 1005 Eighth Street.

Very Few Prisoners. [Special to The Times-Dispatch.] LYNCHBURG, VA., April 17.—The number of persons confined in the Lynchburg jail now is smaller than it has been for some years, having de-

creased fully 50 per cent. in the past two months. The number yesterday was forty-six, and only twenty-seven of these were available for chain-gang work.

Russell-Pregraves. [Special to The Times-Dispatch.] LYNCHBURG, VA., April 17.—Miss Rosa Pregraves, the eldest daughter of William Pregraves, of Hillsboro, Loudoun county, was married yesterday afternoon to J. Gordon Russell, of Harper's Ferry, W. Va. The ceremony was performed in the presence of a few intimates at the residence of the bride, the officiating minister, Rev. W. I. Blakemore, pastor of the Methodist Church, Leesboro.

Fell Under Cars. [Special to The Times-Dispatch.] SPENCER, N. C., April 17.—Irvin Brown, aged twenty-five years, a colored brakeman on the Southern yards at Spencer, was instantly killed here yesterday afternoon. While coupling cars in full under the wheels and was ground to death.



This Style, \$18.00.
Others at \$10.00 to \$35.00.

SPECIAL Monday, April 19th, an 18x40 French Plate Beveled Mirror, with heavy 7-in. gilt frame, polished, special, \$9.98. Sells everywhere at \$12.50. None sold at this price after Monday.

Climax Refrigerators

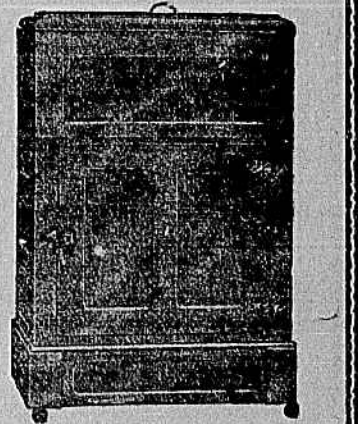
Are well and favorably known. The newest styles are made with round corners; the interior is as smooth as glass; your dishes set flat; the sanitary arrangements are perfect. We have them with large porcelain ice and water coolers.

Ice Chests, Nursery Refrigerators

Climax Refrigerators are well made, they are strictly up-to-date in every way.

When you buy a Climax, you get the full value in your Refrigerator.

Climax Refrigerators sell at \$7.50 up to \$27.50, every one fully warranted.



Sturgis Go-Carts

Are still in the lead. It's the most compact, easy to open and close, never out of order and costs less than most bulky, cumbersome carts, that are always out of order.

STURGIS Carts
Are Always Right

Perfection Oil Cook Stoves

Two and three-burner, with single or double ovens.

China Matting

Heavy, durable goods, a large line of new patterns and colorings. Striking effects in Japan Matting, floral and carpet effects.

Matting Rugs, 3 feet by 6 feet, only 59 cents each. We lay all matting free.



Rothert & Co., Fourth & Broad